

A Thermochemical Model of a Reforming Process Using Hydrocarbon Fuels which is Included in a Fuel Cell System

S. Wenzel

Oel-Wärme-Institut gGmbH, Germany

Abstract

In the field of fuel cell technology different fuel cells will reach the break-even point in the soon future. In consideration of the fuel infrastructure liquid hydrocarbons like gas oil, diesel, or gasoline will play an important role in the commercialisation of fuel cell systems. In many fuel cell applications the usage of liquid hydrocarbons is inevitable. Liquid fuels offer high storage densities and an already existing infrastructure.

The Oel-Wärme-Institut works on the development of reformer systems to convert liquid fuels into a hydrogen and carbon monoxide rich gas. The partial oxidation is a simple and cheap reforming-technology especially for mobile but also for stationary applications. In contradiction to the auto thermal reforming and the steam-reforming it is not necessary to handle water for the process of partial oxidation. In the real operation the very small operating range makes complicate the process. The recirculation of anode-off gas is a possibility to handle the real process.

The presentation will discuss a thermo chemical model of a reforming process based on hydrocarbon fuels which is included in a fuel cell system. This model has bin computed with ChemSheet. The borderlines of the reforming process will be described. Here the impact of the recirculation of anode-off gas on the reforming-process will be discussed with simulated data.